Grade K: Pushes and Pulls

Stage 1 Desired Results

ESTABLISHED GOALS:

Competencies:

Nature of Science and Engineering

- ***Students will demonstrate the ability to work collaboratively and individually to generate testable questions or define problems, plan and conduct investigations using a variety of research methods in various settings, analyze and interpret data, reason with evidence to construct explanations in light of existing theory and previous research, and effectively communicate the research processes and conclusions.***

Cause & Effect

- ***Students will demonstrate the ability to investigate, explain, and evaluate potential causal relationships by using evidence to support claims and predictions about the mechanisms that drive those relationships.***

Content Standards:

- K-PS2-1. Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.
- K-PS2-2. Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.

Transfer

*Students will be able to independently use their learning to **identify causal relationships in the physical environment.***

Meaning

ENDURING UNDERSTANDINGS

Students will understand that…

- simple tests can be designed to gather evidence to support or refute student ideas about causes.

ESSENTIAL QUESTIONS

- Which is better: pushing or pulling?

Acquisition

Students will know…

- *that pushes and pulls can have different strengths and directions.*
- *that pushing or pulling on an object can change the speed or direction of its motion and can start or stop it.*
- *that when objects touch or collide, they push on one another and can change motion.*
- *that a bigger push or pull makes things speed up or slow down more quickly.*
- *that a situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions.*

vocabulary: collide, direction, experiment, force, invent, machine, model, motion, observe, predict, pull, push, speed, strength, strong, weak

Students will be skilled at…

- *investigating the effects of different strengths and directions of pushes and pulls.*
- *comparing the effects of different strengths or directions of pushes on the motion of an object.*
- *comparing the effects of different strengths or directions of pulls on the motion of an object.*
- *analyzing data to decide if a design solution works the way it was supposed to in changing the speed or direction of an object when pushed or pulled.*

Content Area Literacy Standards

not applicable

21st Century Skills

- *make judgments and decisions*
- *reason effectively*
- *access and evaluate information*
- *think creatively*

Stage 2 - Evidence

Evaluative Criteria	*Assessment Evidence*
	PERFORMANCE TASK(S):
	OTHER EVIDENCE:

Stage 3 – Learning Plan

Summary of Key Learning Events and Instruction

Language Arts Integration	*Mathematics Integration*
• RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-PS2-2) • W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). • SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood.	• MP.2 Reason abstractly and quantitatively. • K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. • K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/”less of” the attribute, and describes the difference.
Technology Integration	***District Materials***